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2683

DATE MAILED: 06/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/004,989

**Applicant(s)**

TERRANOVA ET AL.

**Examiner**

Meless N. Zewdu

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 14 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-84 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20, 22-24, 26-39, 43, 44, 46-59, 62-67, 69-80 and 82-84 is/are rejected.
- 7) ☒ Claim(s) 21, 25, 40-42, 45, 60, 61, 68 and 81 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Response to Amendment (RCE)***

1. This action is in response to the communication filed on 04/14/05.
2. Claims 1-84 are pending in this action.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 6-20, 24, 26-39, 43-44, 46-52, 54-59, 62-64, 69-77 and 82-84 are rejected under 35 U.S.C. 103(a) as being unpatentable over Palmero et al. (Palmero) (WO 96/37052) in view of Komrmusch (3,906,405).

**As per claim 1:** a method for supporting inductive communication, the method comprising the steps of:

coupling a transducer to a selected first circuit for transmitting and receiving to a selected second circuit for receiving reads on '052 (see page 5, lines 10-24). But, Palmero does not explicitly teach about adjusting electrical characteristics of the first circuit to increase a magnetic field generated by the transducer and adjusting electrical characteristics of the second circuit to be different from the electrical characteristics of

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the first circuit to increase a signal generated by the transducer, as claimed by applicant. However, in a related field of endeavor, Kommrusch teaches about tunable antenna coupling circuit that control the effective values in the circuit to match the impedance of an antenna at different frequencies to efficiently apply signals between the antenna and the transceiver (see entire document, particularly col. 1, line 36-col. 2, line 31; col. 4, line 8-col.5, line 25). The modifying reference (Kommursch) includes inductor banks and capacitor tanks whose smaller values are progressively increased to achieve a range of selectable frequencies (see col. 3, lines 1-29). Both of the prior art references are wireless systems, particularly directed to coupling tunable antenna/s to a transceiver using circuit adjustment techniques. Hence, the references are reasonably combinable. Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify Palmero's reference with the teaching of Kommrusch for the advantage of providing an improved automatic coupling circuit which is operable over a wide frequency range for coupling signals between an antenna/transducer and a radio equipment/transceiver (see col. 1, lines 36-39). But, Palmero in view of Kommursch do not explicitly teach about the characteristics of a transmitting and receiving circuits (first and second circuits) being different from each other, as claimed by applicant. However, in a related field of endeavor,

**As per claim 2:** a method, wherein the characteristics of the first and second circuits are adjusted using passive circuit components reads on '405 (see col. 1, line 44-col. 2, line 31). Capacitors and inductors of the prior art are passive components.

**As per claim 3:** a method as in claim 1 further comprising the steps of:

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transmitting a magnetic field over the transducer when the transducer is coupled to the first circuit reads on '052 (see page 5, lines 10-24).

receiving a magnetic field over the transducer when the transducer is coupled to the second circuit reads on '052 (see page 5, lines 10-24).

**As per claim 4:** a method, further comprising the step of:

adjusting a capacitance of the first circuit to reduce an effective impedance of the transducer for transmitting reads on '405 (see col. 1, line 44-col. 2, line 31; col. 2, line 45-col. 3, line 21).

adjusting a capacitance of the second circuit to increase an effective impedance of the transducer for receiving reads on '405 (see col. 1, line 44-col. 2, line 31; col. 2, line 45-col. 3, line 21). In a duplexer, the first and the second circuits have to be independently adjusted.

**As per claim 6:** a method, wherein the electrical characteristics of the first and second circuits are adjusted to achieve an efficient coupling between either a transmitter or receiver reads on '405 (see col. 1, line 44-col. 2, line 31).

**As per claim 7:** a method, further comprising the step of:

adjusting a reactance of the first circuit to transmit a magnetically encoded signal at a first carrier frequency and adjusting characteristics of the second circuit to receive a magnetically encoded signal at a second carrier frequency reads on '405 (see col. 1, line 44-col. 2, line 31; col. 2, line 45-col. 21). Transmitting magnetically encoded signal is provided by Palmero. When the references are combined as discussed above,

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adjusting the characteristics of the circuits (transceiver), as taught by Kommrusch, will benefit Palmeros inductive communication system.

**As per claim 8:** a method, further comprising the step of:

disposing an inductive element in the second circuit, the inductive element having an approximate inductance as that of the transducer reads on '405 (see col. 1, line 44-col. 2, line 31; col. 2, line 45-col. 3, line 21).

**As per claim 9:** a method, wherein the second circuit includes at least a portion of the first circuit that is coupled via a switch reads on '052 (see page 5, lines 10-24). Since the duplex includes a switch/selecting circuit, at least a portion of one circuit must be part of the other (as it relates transmitter and receiver).

**As per claim 10:** a method, wherein the first circuit serially tunes the transducer for transmitting over the transducer and the second circuit parallel tunes the transducer for receiving over the transducer reads on '405 (see col. 1, line 44-col. 2, line 20). Specific configuration of a circuit components is a choice of design. As can be seen in the prior art, the components provided therein provide an efficient coupling between an antenna/transducer and the transceiver devices/circuitries.

**As per claim 11:** a method for supporting communication, the method comprising the steps of:

switching to select either transmitting or receiving over a transducer reads on '052 (see page 5, lines 10-27). A selecting circuitry includes a switching function. But, Palmero does not explicitly teach about effectively tuning the transducer, via a first circuit, to be a low impedance device for generating a magnetic field when a transmitter is switched to

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transmit over the transducer, and via a second circuit, effectively tuning the transducer to be a high impedance device for receiving a magnetic field when a receiver is switched to receive over the transducer, as claimed by applicant. However, in a related field of endeavor, Kommrusch teaches about tunable antenna coupling circuit that control the effective values in the circuit to match the impedance of an antenna at different frequencies to efficiently apply signals between the antenna and the transceiver (see entire document, particularly col. 1, line 36-col. 2, line 31). Both of the prior art references are wireless systems, particularly directed to coupling tunable antenna/s to a transceiver using circuit adjustment techniques. Hence, the references are reasonably combinable. Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify Palmero's reference with the teaching of Kommrusch for the advantage of providing an improved automatic coupling circuit which is operable over a wide frequency range for coupling signals between an antenna/transducer and a radio equipment/transceiver (see col. 1, lines 36-39).

**As per claim 12:** a method, wherein the first circuit is serially tuned for transmitting over the transducer and the second circuit is parallel tuned for receiving over the transducer reads on '405 (see col. 1, line 44-col. 2, line 20). Specific configuration of a circuit components is a choice of design. As can be seen in the prior art, the components provided therein provide an efficient coupling between an antenna/transducer and the transceiver devices/circuitries.

**As per claim 13:** a method, further comprising the step of:

in a transmitting mode, reducing an overall reactance of the first circuit including the

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transducer by substantially matching an inductance of the transducer with a capacitance provided by the first circuit reads on '405 (see col. 1, line 44-col. 2, line 20).

**As per claim 14:** a method, further comprising the step of:

via switching, decoupling the transmitter from the first circuit and transducer, and coupling the receiver and portion of the second circuit to the first circuit and the transducer reads on '052 (see page 5, lines 10-27). A duplexer with a selecting circuit connects a transducer with a first and second circuit (transceiver) as needed.

**As per claim 15:** a method, further comprising the step of from the transmitter, generating an output at one of two voltages that is coupled to drive the transducer reads on '052 (see page 5, lines 10-27). Selecting the strongest signal includes outputting at least one voltage that is coupled to drive the transducer.

**As per claim 16:** a method, further comprising the step of:

disposing a resistance in series with the transducer reads on '405 (see col. 1, line 44-col. 2, line 31). Impedance matching includes resistance.

**As per claim 17:** a method, further comprising the step of:

tuning a combined impedance of the first circuit and transducer for maximal magnetic power output of the transducer at a particular carrier frequency reads on '405 (see col. 1, line 44-col. 2, line 31).

**As per claim 18:** a method, further comprising the step of:

adjusting an impedance of the first and second circuit to transmit and receive over the transducer at a substantially similar carrier frequency reads on '405 (see col. 1, line 44-col. 2, line 31).



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**As per claim 19:** a method, further comprising the step of:

varying inductive characteristics of the transducer to adjust a combined impedance of the first circuit and transducer reads on '405 (see col. 1, line 44-col. 2, line 31).

**As per claim 20:** a method, further comprising the step of:

adjusting a reactance of the first or second circuits by switching selected capacitors of a capacitor bank reads on '405 (see col. 2, line 50-col. 3, line 21).

**As per claim 24:** a method, further comprising the step of:

in a receiving mode, coupling at least a portion of the first circuit to the second circuit via a switch and decoupling the transmitter from at least a portion of the first circuit and transducer reads on '052 (see page 5, lines 10-24). A duplexer with a selecting circuit functions in two modes (transmit and receive) by being coupled and decoupled.

**As per claim 26:** a method, wherein a combined reactance of the second circuit coupled with at least a portion of the first circuit is reduced via an inductor matched with an inductance of the transducer reads on '405 (see col. 1, line 44-col. 2, line 20; col. 2, line 40-col. 3, line 21).

**As per claim 27:** a method, further comprising the step of:

disposing an electronic switch circuit between an output of the transmitter and the first circuit for coupling and decoupling the transmitter to the first circuit reads on '052 (see page 5, lines 10-24). A selecting circuitry is a switch.

**As per claim 28:** a method, further comprising the steps of:

providing switching capability to select which of multiple transducers to transmit and receive a magnetically encoded signal depending on which transducer is selected reads

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on '052 (see page 2, lines 10-20; page 5, lines 10-27), adjusting an impedance of the first or second circuit reads on '405 (see col. 1, line 44-col. 2, line 20).

**As per claim 29:** a method, further comprising the steps of:

adjusting a reactance of the first circuit depending on a selected one of the multiple transducers to minimize an overall impedance of the selected transducer and first circuit reads on '405 (see col. 1, line 44-col. 2, line 31).

driving a combination of the selected one of the multiple transducers and the first circuit with the transmitter reads on 405 (see col. 2, lines 14-31).

**As per claim 30:** a method, further comprising the step of:

disposing the multiple transducers to be substantially orthogonal to each other reads on '052 (see page 1, lines 10-20).

**As per claim 31:** a method, further comprising the step of:

switching the first and second circuit to transmit on one transducer while receiving on another transducer reads on '052 (see page 5, lines 10-24).

**As per claim 32:** a method, further comprising the step of:

switching the second circuit and receiver to receive on a different transducer when no signal is received on a particular transducer reads on '052 (see page 5, lines 10-24).

**As per claim 33:** a method, further comprising the steps of:

setting switch circuitry to receive over the transducer reads on '052 (see page 5, lines 13-20).

transmitting a signal at a particular carrier frequency on a second transducer whose output couples to the transducer reads on '052 (see page 5, lines 10-24).

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adjusting a reactance of the second circuit to receive a maximum signal over the transducer reads on '405 (see col. 1, line 44-col. 2, line 31).

**As per claim 34:** a method, further comprising the step of:

disposing a switch at an output of the transmitter to couple the transmitter to the first circuit and transducer reads on '052 (see page 5, lines 10-24). The selecting circuitry can be considered a switch.

**As per claim 35:** a method, further comprising the step of:

switching to a receiving mode to receive over the transducer reads on '052 (see page 5, lines 10-24).

increasing an effective impedance of the transducer to receive an optimal signal at the receiver reads on '405 (see col. 1, line 44-col. 2, line 31).

**As per claim 36:** a method for supporting communication comprising the steps of:

switching to select one of multiple circuit paths for either transmitting or receiving over a transducer via inductive coupling reads on '052 (see page 5, lines 18-20). A circuitry that can select includes a switch. But, Palmero does not explicitly teach about reducing an overall impedance of a first circuit path including the transducer to transmit an inductive signal over the transducer and reducing an overall impedance of at least a portion of a second circuit path including a switch for receiving an inductive signal over the transducer, as claimed by applicant. However, in a related field of endeavor, Kommrusch teaches about tunable antenna coupling circuit that control the effective values in the circuit to match the impedance of an antenna at different frequencies to

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efficiently apply signals between the antenna and the transceiver (see entire document, particularly col. 1, line 36-col. 2, line 31). Both of the prior art references are wireless systems, particularly directed to coupling tunable antenna/s to a transceiver using circuit adjustment techniques. Hence, the references are reasonably combinable. Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify Palmero's reference with the teaching of Kommrusch for the advantage of providing an improved automatic coupling circuit which is operable over a wide frequency range for coupling signals between an antenna/transducer and a radio equipment/transceiver (see col. 1, lines 36-39).

**As per claim 37:** a method, further comprising the steps of:

switching a transmitter to transmit over the transducer via the first circuit path reads on '052 (see page 5, lines 13-27).

reducing an overall impedance of the first circuit path including the transducer by substantially matching an impedance of the transducer with circuit components disposed along the first circuit path reads on '405 (see col. 1, line 36-col. 2, line 31).

**As per claim 38:** a method, wherein the circuit components along the first path includes at least one capacitor to reduce an overall impedance of the first circuit reads on '405 (see col. 1, line 44-col. 2, line 31; col. 2, line 50-col. 3, line 21). The capacitor bank of the prior art is used to adjust the over all circuit impedance.

**As per claim 39:** a method, further comprising the step of:

disposing the second circuit path to include at least a portion of the first circuit path reads on '052 (see page 5, lines 10-24).

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decoupling the transmitter from the first circuit path via a first switch reads on '052 (see page 5, lines 10-24). A selecting circuitry is a switch to the duplex.

**As per claim 43:** a method wherein the second circuit path includes a serially disposed switch reads on reads on '052 (see page 10-27). A switch is know to be in series to with the device it controls.

**As per claim 44:** a method further comprising the step of:  
tuning a combined reactance along the first circuit path including the transducer for maximal magnetic power output of the transducer at a particular carrier frequency reads on '405 (see col. 1, line 44-col. 2, line 20).

**As per claim 46:** a method further comprising the step of:  
selecting among which of the multiple transducers to transmit and receive information reads on '052 (see page 5, lines 10-24; page 6, lines 19-30).  
depending on which transducer is selected, adjusting an impedance along a corresponding circuit path to respectively transmit or receive over the selected transducer reads on '405 (see col. 1, line 36-col. 2, line 31).

**As per claim 47:** a method further comprising the step of:  
disposing the multiple transducers to be substantially orthogonal to each other reads on '052 (see page 5, lines 13-27).

**As per claim 48:** a method further comprising the steps of:  
coupling a receiver to the second circuit path for receiving over the transducer reads on '052 (see page 5, lines 10-24). A duplexer is able to couple a transducer to a transmitter and a receiver (a first and a second circuits) as needed.

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transmitting a signal at a particular carrier frequency on a second transducer whose output couples to the transducer reads on '052 (see abstract; page 5, lines 10-24). The prior art reference is able to select a particular carrier frequency.

adjusting a reactance along the second circuit path to receive a maximum signal at the receiver reads on '405 (see col. 1, line 44-col. 2, line 31; col. 2, line 45-col. 3, line 21).

Impedance matching includes adjusting reactance of a capacitor.

**As per claim 49:** a method further comprising the step of:

Reducing the reactance of a portion along the second circuit path for receiving over the transducer reads on '405 (see col. 1, line 36-col. 2, line 31).

**As per claim 50:** a method further comprising the step of:

tuning the transducer with a capacitor in parallel with the transducer reads on '405 (see col. 1, line 44-col. 2, line 20).

**As per claim 71:** the features of claim 71 are similar to the features of claim 1, except "decoupling the transducer from the first circuit path and coupling the transducer to the second circuit path to receive" wherein "the second circuit path including a portion of the first circuit path". This feature is directed to a half duplexer which is well known in the art of wireless communication. Hence, claim 71 is rejected on the same ground and motivation as claim 1.

**As per claim 72:** a method, wherein a capacitance of the circuit is adjusted to tune the transducer reads on '405 (see col. 2, lines 13-20). When the references are combined as discussed above, the capacitance of the circuit provided by Kommursch, will be adjusted (with values from the cap. bank) to tune Palmero's transducer.

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**As per claim 73:** a method, wherein the circuit is adjusted to independently tune the transducer for transceiving an inductive signal reads on '405 (see col. 1, lines 59-65).

**As per claim 74:** a method, further comprising the step of:  
selecting a setting of the circuit via electronic switching to tune the transducer reads on '405 (see col. 1, lines 44-59).

**As per claim 75:** a method, further comprising:  
sweeping through a range of circuit settings to determine which of multiple settings is optimal for transceiving over the transducer reads on '405 (see col. 1, lines 44-65).

**As per claim 76:** a method further comprising:  
reducing power consumption of the circuit by adjusting the circuit for generating a more efficient magnetic signal reads on '052 (see abstract; page 4, line 28-page 5, line 3).

**As per claim 77:** a method, further comprising:  
switching selected capacitors of a capacitor bank to ground via switches to tune the transducer for transceiving reads on '405 (see col. 1, line 44-col. 2, line 31; col. 2, line 50-col. 3, line 21).

**As per claim 82:** a method, further comprising:  
adjusting the circuit to transceive over the transducer at a selected carrier frequency reads on '052 (see page 6, lines 13-30).

**As per claim 83:** a method, further comprising:  
modulating digital data on the carrier frequency to transmit information to a target receiver reads on '052 (see page 1, lines 28-29; page 2, lines 8-20; page 6, lines 13-30).

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**As per claim 84:** a method, further comprising:

switching an inductor in series with the transducer to tune the transducer for receiving a magnetic field reads on '405 (see col. 1, lines 40-65; col. 2, line 59-col. 3, line 21).

Claims 51-52, 54-59, 62-64 and 69-70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Palmero in view of Kommursch and further in view of Lou et al. (Lou) (US 6,369,550 B1).

**As per claim 51:** a method for supporting communication comprising the steps of:

coupling one of multiple transducers to a circuit to transmit or receive a magnetic field reads on '052 (see page 2, lines 8-20). But, Palmero does not explicitly teach about adjusting characteristics of the circuit depending on which of the multiple transducers is coupled to the circuit, as claimed by applicant. However, in a related field of endeavor, Kommrusch teaches about tunable antenna coupling circuit that control the effective values in the circuit to match the impedance of an antenna at different frequencies to efficiently apply signals between the antenna and the transceiver (see entire document, particularly col. 1, line 36-col. 2, line 31). Both of the prior art references are wireless systems, particularly directed to coupling tunable antenna/s to a transceiver using circuit adjustment techniques. Hence, the references are reasonably combinable. Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify Palmero's reference with the teaching of Kommursch for the advantage of providing an improved automatic coupling circuit which is operable over a wide frequency range for coupling signals between an antenna/transducer and a radio



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equipment/transceiver (see col. 1, lines 36-39). But, Palmero in view of Kommursch do not explicitly teach about adjusting characteristics of a circuit during use based upon feedback to more efficiently transmit or receive over one of multiple transducers, as claimed by applicant. However, in a related field of endeavor, Lou teaches about a feedback technique for adjusting input impedance by balancing inductive and capacitive components a feedback control circuit (see entire document, particularly abstract). Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to further modify the above references with the teaching of Lou for the advantage of permitting adjustment of input impedance using Lou's feedback circuit in the system of Palmero as modified Kommursch.

**As per claim 52:** a method, wherein a capacitance of the circuit is adjusted to tune the transducer reads on '405 (see col. 1, line 44-col. 2, line 31; col. 2, line 45- col. 3, line 21). When the references are combined as discussed above, the capacitance of the circuit provided by Kommursch, will be adjusted (with values from the cap. bank) to tune Palmero's transducer.

**As per claim 54:** a method, further comprising the step of:  
selecting a setting of the circuit via electronic switching to tune the transducer reads on '405 (see col. 1, lines 44-59).

**As per claim 55:** a method, further comprising the step of:  
positioning each of the multiple transducers along a unique axis with respect to each other reads on '052 (see page 5, lines 13-27).

**As per claim 56:** a method, further comprising the step of:

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orthogonally positioning three transducers with respect to each other reads on '052 (see page 5, lines 13-27).

**As per claim 57:** a method further comprising the step of:

selecting from which of the multiple transducers to transmit or receive a magnetic field reads on '052 (see page 5, lines 10-27).

tuning the selected transducer to support a wireless link with a remote transceiver device having a single transducer that transmits and receives reads on '052 (see page 6, lines 13-30).

**As per claim 58:** a method further comprising the step of:

adjusting an impedance of the circuit to tune a transducer for transmitting or receiving reads on '405 (see col. 1, lines 59-65).

**As per claim 59:** a method further comprising the steps of:

coupling a first transducer of the multiple transducers to the circuit for transmitting reads on '052 (see page 5, lines 10-12).

coupling a second transducer of the multiple transducers to the circuit for receiving reads on '052 (see page 5, lines 10-12).

transmitting a signal over the first transducer and receiving the signal over the second transducer reads on 052 (see page 5, lines 10-12). Basically, the features of claim 59 are similar to the features of claim 1.

**As per claim 62:** a method further comprising:

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sweeping through a range of circuit settings to determine which of multiple settings is optimal for transmitting or receiving over a selected transducer reads on '405 (see col. 1, lines 44-65).

**As per claim 63:** a method further comprising:

Reducing power consumption of the circuit by increasing a magnetic a magnetic signal generated by a selected transducer based upon adjustment to the circuit reads on '052 (see abstract; page 4, line 28-page 5, line 3).

**As per claim 64:** a method further comprising:

Switching selected capacitors of a capacitor bank to ground via switches to tune a transducer for transmitting or receiving reads on '405 (see col. 1, line 44-col. 2, line 31; col. 2, line 50-col. 3, line 21).

**As per claim 69:** a method further comprising:

adjusting the circuit to transmit or receive over the transducer at a selected carrier frequency reads on '052 (see page 6, lines 13-30).

**As per claim 70:** a method further comprising:

modulating digital data on the carrier frequency to transmit information to a target receiver reads on '052 (see page 1, lines 28-29; page 2, lines 8-20; page 6, lines 13-30).

Claims 5, 22-23 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references applied to claims 1, 12, 36, 51 and 71 above, and further in view of Shloss et al. (Shloss) (US 5,425,032).

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**As per claim 5:** but, the reference cited above do not explicitly teach about a method of time division multiplexing the transducer between the first and second circuits to support bidirectional communication with a transceiver at a remote location, as claimed by applicant. However, in a related field of endeavor, Shloss teaches about a TDMA network used for communication between a reader and a transponder for a short range communication (see col. 3, lines 6-32; col. 4, lines 13-38; col. 5, lines 8-20; col. 7, line 23-col. 8, line 2). Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to further modify the above references with the teaching of Shloss for the advantage of enabling many users share a single frequency channel by taking turns (see col. 7, lines 3-9).

**As per claim 22:** a method, wherein information is transmitted and received over the transducer based on time division multiplexing read on '032 (see col. 3, lines 6-32; col. 4, lines 13-38; col. 5, lines 8-20; col. 7, line 23-col. 8, line 2). Since claim 32 is similar to claim 5, it is rejected on the same ground and motivation as claim 5.

**As per claim 23:** a method, wherein the transducer supports half-duplex communication with a remote transceiver reads on '052 (see page 6, lines 19-30).

**As per claim 53:** a method as in claim, wherein the circuit is adjusted to independently tune the transducer for transmitting or receiving at different time intervals reads on '032 (see col. 3, lines 6-32; col. 4, lines 13-38; col. 5, lines 8-20; col. 7, line 23-col. 8, line 2). Since claim 53 is similar to claim 5, it is rejected on the same ground and motivation as claim 5.

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Claims 78-80 and 65-67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Palmero in view of Petro as applied to claim 71 above, and further in view of Wilkins et al. (Wilkins) (US 4,965,607).

**As per claim 78:** but, Palmero in view of Kommrusch do not explicitly teach about a method of:

storing circuit setting information in memory regarding how to set a circuit, as claimed by applicant. However, in a related field of endeavor, Wilkins teach about an antenna coupler wherein the coupler includes a means for tracking the frequency of a swept transmitted signal and a means responsive to tracked signal for automatically adjusting the adjustable impedance matching means to provide proper impedance matching (see col. 1, lines 55-64; col. 2, lines 39-45) and wherein the coupler recalls the matched network settings from **memory** (see col. 3, line 65-col. 4, line 3). Note: using the circuit settings for transceiving over the transducer is an intended use. The stored circuit settings, as can be understood by one of ordinary skill in the art, can also be used in other areas of communications. Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to further modify the above references with the teaching of Wilkins for the advantage of tuning the antenna to a desired frequency without a transmit tune sequence (see col. 4, lines 2-3).

**As per claim 79:** a method, further comprising:

learning which of multiple settings is optimal for transceiving over the transducer and storing corresponding information in memory reads on '607 (see col. 3, line 65-col. 4, line 3).

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**As per claim 80:** a method, further comprising:

retrieving circuit setting information from memory and adjusting characteristics of the circuit to transceive over the transducer reads on '607 (see col. 3, line 65-col. 4, line 3).

Tuning an antenna requires an adjustment of a radio equipment.

**As per claim 65:** a method further comprising:

storing circuit setting information in memory regarding hoe to set a circuit for receiving or transmitting reads on '607 (see col. 3, line 65-col. 4, line 3).

**As per claim 66:** a method further comprising:

learning which of multiple settings is optimal and storing corresponding informnation in memory reads on reads on '607 (see col. 3, line 65-col. 4, line 3).

**As per claim 67:** a method further comprising:

retrieving circuit setting information from memory and adjusting characteristics of the circuit to transmit or receive over a transducer reads on '607 (see col. 3, line 65-col. 4, line 3). Tuning an antenna requires an adjustment of radio equipment.

### ***Response to Arguments***

Applicant's arguments with respect to claim 51 have been considered but are moot in view of the new ground(s) of rejection. With respect to claims 1, 11, 36, 71 and particularly claim 1, applicant asserts that the references applied to these claims do not address the feature "adjusting electrical characteristics of the second circuit to be different from the electrical characteristics of the first circuit". Examiner realizes that this

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requirement is needed to select/set the system at a desirable frequency which is similar to the technique provided by Kommursch for setting channels by selectively connecting capacitors and inductors to banks (see col. 3, lines 14-21). Hence, the argument is found not be convincing.

### ***Allowable Subject Matter***

The indicated allowability of claim 59 is withdrawn for reason/s described in the body of the rejection.

Claims 21, 25, 40-42, 45, 60-61, 68 and 81 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Meless N. Zewdu whose telephone number is (571) 272-7873. The examiner can normally be reached on 8:30 am to 5:00 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Trost can be reached on (571) 272-7872. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Meless Zewdu

*Mr. Z.*

Examiner

17 June 2005.

*W. Trost*

**WILLIAM TROST  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600**